After a prolonged quiet period, the VCSEL market has woken up to fairly startling news. The long-established merchant leader has passed its business to a relatively small-scale newcomer, Finisar, the maker of fibre-optic transceivers. Coming just before the opto industry's biggest meeting, Photonics West, the VCSEL business has been surprised by the news. Industry observers are still pondering on the ramifications. Once it has all worked through due process, it should become clear whether it was the best move for all parties and the business as a whole.

Roy Szweda, Associate Editor

VCSELs - securing supply

One certainty is that by securing its future VCSEL supply Finisar has been catapulted into the Top 3 rankings. Meanwhile, the world's largest VCSEL supplier, Agilent may be less concerned than other players. This is because nearly all of its VCSEL business is captive. More concerned would be Infineon and Zarlink, the other merchant majors.

WLAN parallels

This story comes not so long after a similar striking change in the telecoms component business. Only six months ago, market leader Intersil exited the WLAN chip business, handing it over to Globespan Virata. It did not end there, because soon afterwards GV merged with another major WLAN chip house, Conexant.

The scenario is proving very familiar as major players announce their intention to refocus on core strategies. This usually means divesting manufacturing and usually components. In Honeywell's case this was not too surprising, given all of its other interests. However, it does in effect mean an end to its participation in the merchant opto components business.

As befits its pioneering status, Honeywell has amassed considerable IP in VCSELs. Indeed it is still being awarded patents as evidenced by one in February on VCSEL mode control using transversal bandgap structure in VCSELs. Industry observers constantly reiterate the vital role being played by IP in the VCSEL market - future success lies with holding patents in the key processing steps.

The reason for this is that despite the hype, VCSEL manufacturing is not straightforward. Achieving good yields of low cost devices with the characteristics desired by the module makers - temperature stable, reliable, VCSELs in IR or visible wavelengths - is a challenging task. For example, precise control is required during MOVPE/MBE growth to prevent oxidation of Al-containing layers.

Relieved customers

A certain amount of relief will have been expressed by Honeywell's customers of course. In fact it is likely that one of the main reasons for Finisar's acquisition is securing supply. As the market is at last picking up and orders are arriving, it is inconvenient to have to renegotiate over such critical components. There will be some reservations in some quarters of course. Finisar has plenty of experience in manufacturing, but this has until now been confined to transceivers.

Nevertheless, they are keeping the Honeywell factories going for now to minimise disruption. Similarly, some of Honeywell's customers will be competitors to Finisar. Some may therefore be worrying whether in due course Finisar will follow the Agilent model and go back to being a transceiver maker.

The future is organic

By no means has the market potential of VCSELs been exhausted. The bulk of today's substantial market is for high-speed datacom products in the range 850- and 980-nm. But most players have their eye on the longer wavelengths, such as 1.3- and 1.55-microns for 10 Gbit/s Ethernet.

It does not end there, providing companies can fully, commercially exploit VCSELs for sensors either as discrete devices or as arrays and in conjunction with MEMS. Red VCSELs for plastic fibre optics are expected to become a major contributor to the opto market in the next few years.

Further out, 2D arrays are being mooted for optical interconnects in supercomputers.

To conclude on a note of caution, there is the possibility of the VCSEL market coming under threat from organic materials. The parallels are already there with the emergence of OLEDs as a viable commercial technology.

Eastman Kodak, which is already strong in OLEDs, has patented an organic vertical cavity phase-locked laser array (see: US Patent No: 6687274), which it says could be made to emit over the entire visible spectrum.